

OBSERVATIONS & RECOMMENDATIONS

After reviewing data collected from **Northwood Lake, Northwood**, the program coordinators have made the following observations and recommendations.

Thank you for your continued hard work sampling the lake this year! Your monitoring group sampled the deep spot **four** times this year and has done so for many years! As you know, conducting multiple sampling events each year enables DES to more accurately detect water quality changes. Keep up the great work!

Your monitoring group utilized the University of New Hampshire's Lay Lakes Monitoring Laboratory to analyze total phosphorus and *E. coli* samples. The data were transferred to the DES Environmental Monitoring Database (EMD) and are included in this report.

A Weed Watcher training was conducted for lake residents in Deerfield and Northwood during **2009**. Volunteers were trained to survey the lake once a month from **May** through **September**. To survey, volunteers slowly boat, or even snorkel, around the perimeter of the lake or pond and any islands it may contain. Using the materials provided in the Weed Watcher kit, volunteers look for any species that are suspicious. After a trip or two around the lake or pond, volunteers will have a good knowledge of its plant community and will immediately notice even the most subtle changes. If a suspicious plant is found, the volunteers immediately send a specimen to DES for identification. If the plant specimen is an exotic species, a biologist will visit the site to determine the extent of the problem and to formulate a management plan to control the nuisance infestation. Remember that early detection is the key to controlling the spread of exotic plants.

FIGURE INTERPRETATION

CHLOROPHYLL-A

- **Figure 1 and Table 1:** Figure 1 in Appendix A shows the historical and current year chlorophyll-a concentration in the water column. Table 1 in Appendix B lists the maximum, minimum, and mean

concentration for each sampling year that the lake has been monitored through VLAP.

Chlorophyll-a, a pigment found in plants, is an indicator of the algal abundance. Algae (also known as phytoplankton) are typically microscopic, chlorophyll producing plants that are naturally occurring in lake ecosystems. The chlorophyll-a concentration measured in the water gives biologists an estimation of the algal concentration or lake productivity. **The median summer chlorophyll-a concentration for New Hampshire's lakes and ponds is 4.58 mg/m³.**

The current year data (the top graph) show that the chlorophyll-a concentration **increased slightly** from **May** to **June**, and then **decreased** from **June** to **August**.

The historical data (the bottom graph) show that the **2009** chlorophyll-a mean is **approximately equal to** the state and similar lake medians, refer to Appendix F.

Overall, the statistical analysis of the historical data (the bottom graph) shows that the mean annual chlorophyll-a concentration has **not significantly changed** since monitoring began. Specifically, the mean annual chlorophyll-a concentration has **fluctuated between approximately 2.37 and 7.82 mg/m³**, but has **not continually increased or decreased** since **1998**. Please refer to Appendix E for a detailed statistical analysis explanation and data print-out.

While algae are naturally present in all lakes and ponds, an excessive or increasing amount of any type is not welcomed. In freshwater lakes and ponds, phosphorus is the nutrient that algae typically depend upon for growth in New Hampshire lakes. Algal concentrations may increase as nonpoint sources of phosphorus from the watershed increase, or as in-lake phosphorus sources increase. Therefore, it is extremely important for volunteer monitors to continually educate all watershed residents about management practices that can be implemented to minimize phosphorus loading to surface waters.

TRANSPARENCY

- **Figure 2 and Tables 3a and 3b:** Figure 2 in Appendix A shows the historical and current year data for transparency with and without the use of a viewscope. Table 3a in Appendix B lists the maximum, minimum and mean transparency data without the use of a viewscope and Table 3b lists the maximum, minimum and mean

transparency data with the use of a viewscope for each year that the lake has been monitored through VLAP.

Volunteer monitors use the Secchi disk, a 20 cm disk with alternating black and white quadrants, to measure how far a person can see into the water. Transparency, a measure of water clarity, can be affected by the amount of algae and sediment in the water, as well as the natural lake color of the water. **The median summer transparency for New Hampshire's lakes and ponds is 3.2 meters.**

The current year data (the top graph) show that the non-viewscope in-lake transparency **increased** from **June** to **July**, **remained stable** from **July** to **August**, and then **increased** from **August** to **September**.

Please note that a transparency reading was not conducted in May due to high wind conditions.

The historical data (the bottom graph) show that the **2009** mean non-viewscope transparency is **slightly less than** the state and similar lake medians. Please refer to Appendix F for more information about the similar lake median.

The current year data (the top graph) show that the viewscope in-lake transparency **decreased** from **July** to **August**. The transparency measured with the viewscope was generally **greater than** the transparency measured without the viewscope this summer. A comparison of the transparency readings taken with and without the use of a viewscope shows that the viewscope typically increases the depth to which the Secchi disk can be seen into the lake, particularly on sunny and windy days. We recommend that your group measure Secchi disk transparency with and without the viewscope on each sampling event.

It is important to note that viewscope transparency data are not compared to a New Hampshire median or similar lake median. This is because lake transparency with the use of a viewscope has not been historically measured by DES. At some point in the future, the New Hampshire and similar lake medians for viewscope transparency will be calculated and added to the appropriate graphs.

Overall, the statistical analysis of the historical data (the bottom graph) shows that the mean annual in-lake non-viewscope transparency has **not significantly changed** (either *increased* or *decreased*) since monitoring began. Specifically, the in-lake transparency has remained **relatively stable, ranging between approximately 2.50 and 3.85 meters** since **1998**. Please refer to Appendix E for the statistical analysis explanation and data print-out.

Typically, high intensity rainfall causes sediment-laden stormwater runoff to flow into surface waters, thus increasing turbidity and decreasing clarity. Efforts to stabilize stream banks, lake and pond shorelines, disturbed soils within the watershed, and especially dirt roads located immediately adjacent to the edge of tributaries and the lake or pond should continue on an annual basis. Guides to best management practices that can be implemented to reduce, and possibly even eliminate, nonpoint source pollutants, are available from DES upon request.

TOTAL PHOSPHORUS

- **Figure 3 and Table 8:** The graphs in Figure 3 in Appendix A show the amount of epilimnetic (upper layer) phosphorus and hypolimnetic (lower layer) phosphorus; the inset graphs show current year data. Table 8 in Appendix B lists the annual maximum, minimum, and median concentration for each deep spot layer and each tributary since the lake has been sampled through VLAP.

Phosphorus is typically the limiting nutrient for vascular aquatic plant and algae growth in New Hampshire's lakes and ponds. Excessive phosphorus in a lake or pond can lead to increased plant and algal growth over time. **The median summer total phosphorus concentration in the epilimnion (upper layer) of New Hampshire's lakes and ponds is 12 ug/L. The median summer phosphorus concentration in the hypolimnion (lower layer) is 14 ug/L.**

The current year data for the epilimnion (the top inset graph) show that the phosphorus concentration ***decreased slightly*** from **May** to **August**.

The historical data show that the **2009** mean epilimnetic phosphorus concentration is ***slightly greater than*** the state and similar lake medians. Refer to Appendix F for more information about the similar lake median.

The current year data for the hypolimnion (the bottom inset graph) show that the phosphorus concentration ***increased*** from **May** to **August**.

The historical data show that the **2009** mean hypolimnetic phosphorus concentration is ***much greater than*** the state and similar lake medians. Please refer to Appendix F for more information about the similar lake median.

Overall, the statistical analysis of the historical data shows that the epilimnetic (upper layer) phosphorus concentration has **not significantly changed** (either *increased* or *decreased*) since monitoring began. Specifically, the mean epilimnetic phosphorus concentration has remained **relatively stable, ranging between approximately 7 and 15 ug/L** since **1998**. Please refer to Appendix E for the statistical analysis explanation and data print-out.

Overall, the statistical analysis of the historical data shows that the hypolimnetic (lower layer) phosphorus concentration has **not significantly changed** since monitoring began. Specifically, the mean hypolimnetic phosphorus concentration has **fluctuated between approximately 6 and 28 ug/L** since **1998**. Please refer to Appendix E for the detailed statistical analysis explanation and data print-out.

One of the most important approaches to reducing phosphorus loading to a waterbody is to continually educate watershed residents about the watershed sources of phosphorus and how excessive phosphorus loading can negatively impact the ecology and the recreational, economical, and ecological value of lakes and ponds.

TABLE INTERPRETATION

➤ **Table 2: Phytoplankton**

Table 2 in Appendix B lists the current and historical phytoplankton and/or cyanobacteria observed in the lake. Specifically, this table lists the three most dominant phytoplankton and/or cyanobacteria observed in the sample and their relative abundance in the sample.

The dominant phytoplankton and/or cyanobacteria observed in the **July** sample were ***Asterionella* (Diatom)**, ***Tabellaria* (Diatom)**, and ***Dinobryon* and *Ceratium* (Golden Brown and Dinoflagellate)**.

Phytoplankton populations undergo a natural succession during the growing season. Please refer to the “Biological Monitoring Parameters” section of this report for a more detailed explanation regarding seasonal plankton succession. Diatoms and golden-brown algae populations are typical in New Hampshire’s less productive lakes and ponds.

➤ **Table 4: pH**

Table 4 in Appendix B presents the in-lake and tributary current year and historical pH data.

pH is measured on a logarithmic scale of 0 (acidic) to 14 (basic). pH is important to the survival and reproduction of fish and other aquatic life. A pH below 6.0 typically limits the growth and reproduction of fish. A pH between 6.0 and 7.0 is ideal for fish. The median pH value for the epilimnion (upper layer) in New Hampshire's lakes and ponds is **6.6**, which indicates that the state surface waters are slightly acidic. For a more detailed explanation regarding pH, please refer to the "Chemical Monitoring Parameters" section of this report.

The mean pH at the deep spot this year ranged from **6.45** in the hypolimnion to **6.61** in the epilimnion, which means that the water is ***slightly acidic***.

Due to the state's abundance of granite bedrock in the state and acid deposition received from snowmelt, rainfall, and atmospheric particulates, there is little that can be feasibly done to effectively increase lake pH.

➤ **Table 5: Acid Neutralizing Capacity**

Table 5 in Appendix B presents the current year and historical epilimnetic ANC for each year the lake has been monitored through VLAP.

Buffering capacity (ANC) describes the ability of a solution to resist changes in pH by neutralizing the acidic input. The median ANC value for New Hampshire's lakes and ponds is **4.8 mg/L**, which indicates that many lakes and ponds in the state are at least "moderately vulnerable" to acidic inputs. For a more detailed explanation about ANC, please refer to the "Chemical Monitoring Parameters" section of this report.

The mean acid neutralizing capacity (ANC) of the epilimnion (upper layer) was **4.3 mg/L**, which is ***approximately equal to*** the state median. In addition, this indicates that the lake is ***moderately vulnerable*** to acidic inputs.

➤ **Table 6: Conductivity**

Table 6 in Appendix B presents the current and historical conductivity values for tributaries and in-lake data. Conductivity is the numerical expression of the ability of water to carry an electric current, which is determined by the number of negatively charged ions from metals, salts, and minerals in the water column. The median conductivity value for New Hampshire's lakes and ponds is **40.0 uMhos/cm**. For a more detailed explanation, please refer to the

“Chemical Monitoring Parameters” section of this report.

The mean annual epilimnetic conductivity at the deep spot this year was **69.55 uMhos/cm**, which is *slightly greater than* the state median.

The in-lake conductivity has **decreased** (meaning **improved**) in the lake since **2006**. Increases in conductivity typically indicate the influence of human activities on surface water quality. Septic system leachate, agricultural runoff, iron deposits, and road runoff which typically contains road salt during the spring snow melt, can each influence conductivity readings.

This **decreasing** conductivity trend suggests that the elevated rainfall amounts experienced since 2006 might act to dilute the ion concentration in surface waters throughout the watershed. Specifically, the significant summer rainfalls likely increased the flushing rate for many lakes allowing potential watershed pollutants to flush through the system and not concentrate in the stratified surface waters.

However, it is likely that de-icing materials applied to nearby roadways during the winter months may be influencing the conductivity in the lake. In New Hampshire, the most commonly used de-icing material is salt (sodium chloride).

*A limited amount of chloride sampling was conducted during **2009**. Please refer to the discussion of **Table 13** for more information.*

Therefore, we recommend that the **epilimnion** (upper layer) be sampled for chloride next year. This additional sampling may help us identify what areas of the watershed are contributing to the increasing in-lake conductivity.

Please note that the DES Limnology Center in Concord is able to conduct chloride analyses, free of charge. As a reminder, it is best to conduct chloride sampling in the spring as the snow is melting and during rain events.

➤ **Table 8: Total Phosphorus**

Table 8 in Appendix B presents the current year and historical total phosphorus data for in-lake and tributary stations. Phosphorus is the nutrient that limits the algae’s ability to grow and reproduce. Please refer to the “Chemical Monitoring Parameters” section of this report for a more detailed explanation.

The total phosphorus concentrations were **elevated** in the **Flat Meadows Brook Inlet, Lower WTC Inlet and Rt. 4 E Inlet** this year. Record summer rainfall likely increased stormwater runoff and nutrient loading to the tributaries. As impervious surface cover increases in the watershed, stormwater runoff volumes increase. This transports phosphorus-laden stormwater into tributaries and eventually the lake. Efforts should be made in the watershed to reduce impervious surfaces and limit phosphorus sources such as fertilizer use, septic influences, agricultural impacts, and sediment/erosion control.

We also recommend that your monitoring group conduct a stream survey and rain event sampling along these tributaries so that we can determine what may be causing the elevated concentrations.

For a detailed explanation on how to conduct rain event sampling and stream surveys, please refer to the 2002 VLAP Annual Report special topic article, which is posted on the VLAP website at <http://www.des.nh.gov/organization/divisions/water/wmb/vlap/categories/publications.htm>, or contact the VLAP Coordinator.

The total phosphorus concentration in the **Old Dump Rd and Pleasant Pond Inlet** was **elevated (24 and 27 ug/L)** on the **May** sampling event. The turbidity of the samples was also **slightly elevated (2.89 and 1.25 NTUs)**.

The total phosphorus concentration in the **Horse Farm and Lynn Grove Inlet** was **elevated (37 and 74 ug/L)** on the **August** sampling event. The turbidity of the samples was also **elevated (3.51 and 4.38 NTUs)**.

This suggests that the stream bottom may have been disturbed while sampling or that erosion is occurring in the watershed. Weather records indicate < 1.0 inch of rainfall occurred prior to the May sampling event, and 1.0 – 3.0 inches of rainfall occurred prior to the August sampling event.

When the stream bottom is disturbed, phosphorus rich sediment is released into the water column. When collecting tributary samples, please be sure to sample where the tributary is flowing and where the stream is deep enough to collect a “clean” sample free from organic debris and sediment.

If you suspect that erosion is occurring in this area of the watershed, we recommend that your monitoring group conduct a stream survey and rain event sampling along this tributary. This additional

sampling may allow us to determine what is causing the **elevated** levels of turbidity and phosphorus.

For a detailed explanation on how to conduct rain event sampling and stream surveys, please refer to the 2002 VLAP Annual Report special topic article, which is posted on the VLAP website at <http://www.des.nh.gov/organization/divisions/water/wmb/vlap/categories/publications.htm>, or contact the VLAP Coordinator.

The total phosphorus concentration in the **Rt. 4 W Inlet** was **elevated** on each of the sampling events this season. Due to the unusually high water levels and amount of rainfall during the spring and summer of **2009**, it is likely that watershed wetland systems released phosphorus-enriched water into the tributary and ultimately the lake.

➤ **Table 9 and Table 10: Dissolved Oxygen and Temperature Data**

Table 9 in Appendix B shows the dissolved oxygen/temperature profile(s) collected during **2009**. Table 10 in Appendix B shows the historical and current year dissolved oxygen concentration in the hypolimnion (lower layer). The presence of sufficient amounts of dissolved oxygen in the water column is vital to fish and amphibians and bottom-dwelling organisms. Please refer to the “Chemical Monitoring Parameters” section of this report for a more detailed explanation.

The dissolved oxygen concentration was **high** at all deep spot depths sampled in the lake on the **July** sampling event. Typically, shallow lakes and ponds that are not deep enough to stratify into more than one or two thermal layers will have relatively high amounts of oxygen at all depths. This is due to continual lake mixing and diffusion of oxygen into the bottom waters induced by wind and wave action.

The dissolved oxygen concentration was **greater than 100 percent** saturation at the **surface** at the deep spot on the **July** sampling event. Layers of algae can increase the dissolved oxygen concentration in the water column since oxygen is a by-product of photosynthesis. Wave action from wind can also dissolve atmospheric oxygen into the upper layers of the water column. Considering that the wind conditions on the **July** sampling event were breezy, we suspect that wave action contributed to the oxygen super-saturation.

➤ **Table 11: Turbidity**

Table 11 in Appendix B lists the current year and historical data for in-lake and tributary turbidity. Turbidity in the water is caused by

suspended matter, such as clay, silt, and algae. Water clarity is strongly influenced by turbidity. Please refer to the “Other Monitoring Parameters” section of this report for a more detailed explanation.

The hypolimnetic (lower layer) turbidity was **elevated (6.87 NTUs)** on the **July** sampling event. This suggests that the lake bottom may have been disturbed by the anchor or by the Kemmerer Bottle while sampling and/or that the lake bottom is covered by an easily disturbed, thick organic layer of sediment. When the lake bottom is disturbed, phosphorus rich sediment is released into the water column. When collecting the hypolimnion sample, make sure that there is no sediment in the Kemmerer Bottle before filling the sample bottles.

The turbidity in the **Flat Meadows Brook Inlet, Horse Farm, Old Dump Rd, Rte 4 E Inlet, and Town Beach** samples was **slightly elevated** throughout the season. The record summer rainfall likely washed unstable sediments into the tributaries from the nearby watershed.

The turbidity in the **Lynn Grove Inlet** sample was **elevated (4.38 NTUs)** on the **August** sampling event which suggests that the stream bottom may have been disturbed while sampling or that erosion is occurring in this area of the watershed. When the stream bottom is disturbed, sediment, which typically contains attached phosphorus, is released into the water column. When collecting tributary samples please sample where there's sufficient stream flow and depth to collect a “clean” sample free from debris and sediment.

If you suspect erosion in the watershed, we recommend conducting a stream survey to identify sediment erosion. We also recommend that your monitoring group conduct rain event sampling along this tributary. This additional sampling may allow us to determine what is causing the **elevated** levels of turbidity.

For a detailed explanation on how to conduct rain event sampling and stream surveys, please refer to the 2002 VLAP Annual Report special topic article, which is posted on the VLAP website at <http://www.des.nh.gov/organization/divisions/water/wmb/vlap/categories/publications.htm>, or contact the VLAP Coordinator.

➤ **Table 12: Bacteria (*E.coli*)**

Table 12 in Appendix B lists the current year and historical data for bacteria (*E.coli*) testing. *E. coli* is a normal bacterium found in the large intestine of humans and other warm-blooded animals. *E.coli* is used as an indicator organism because it is easily cultured and its

presence in the water, in defined amounts, indicates that sewage **may** be present. If sewage is present in the water, potentially harmful disease-causing organisms **may** also be present.

The *E. coli* concentrations were **low** on each sampling event at **Bridge Inlet, Esther Lane Docks, Lower WTC Inlet, Lynn Grove Inlet, Outlet, Pleasant Pond Inlet, Rte 107 Inlet, Rte 4 W Inlet, Town Beach, and Town Beach Cove** this year. We hope this trend continues!

If residents are concerned about sources of bacteria, such as failing septic systems, animal waste, or waterfowl waste, it is best to conduct *E. coli* testing when the water table is high, when beach use is heavy, or immediately after rain events.

The **Flat Meadows Brook Inlet** *E. coli* concentration was **slightly elevated** on the **May and August** sampling events. However, the concentrations of **112 and 107** counts per 100 mL **were not greater than** the state standard of 406 counts per 100 mL for recreational waters that are not designated public beaches.

The **Horse Farm** *E. coli* concentration was **elevated** on the **September** sampling event. However, the concentration of **232** counts per 100 mL **was not greater than** the state standard of 406 counts per 100 mL for recreational waters that are not designated public beaches.

The **Old Dump Rd** *E. coli* concentration was **slightly elevated** on the **May and June** sampling events. However, the concentrations of **136 and 145** counts per 100 mL **were not greater than** the state standard of 406 counts per 100 mL for recreational waters that are not designated public beaches.

The **Rte 4 E Inlet** *E. coli* concentration was **slightly elevated** on the **May and August** sampling events. However, the concentrations of **174 and 141** counts per 100 mL **were not greater than** the state standard of 406 counts per 100 mL for recreational waters that are not designated public beaches.

In general, the *E. coli* concentrations at the above stations were elevated following rain events. We suspect that the slightly elevated concentrations are a result of wildlife or domestic animal waste. Bacteria are often transported as a result of significant storm events carrying bacteria-laden stormwater to tributaries.

However, if you are concerned about *E. coli* levels at these stations, your monitoring group should conduct rain event sampling and bracket sampling in this area to help us determine the bacteria

source.

For a detailed explanation on how to conduct rain event sampling and stream surveys, please refer to the 2002 VLAP Annual Report special topic article, which is posted on the VLAP website at <http://www.des.nh.gov/organization/divisions/water/wmb/vlap/categories/publications.htm>, or contact the VLAP Coordinator.

➤ **Table 13: Chloride**

Table 13 in Appendix B lists the current year and the historical data for chloride sampling. The chloride ion (Cl⁻) is found naturally in some surfacewaters and groundwaters and in high concentrations in seawater. Research has shown that elevated chloride levels can be toxic to freshwater aquatic life. In order to protect freshwater aquatic life in New Hampshire, the state has adopted **acute and chronic** chloride criteria of **860 and 230 mg/L** respectively. The chloride content in New Hampshire lakes is naturally low, generally less than 2 mg/L in surface waters located in remote areas away from habitation. Higher values are generally associated with salted highways and, to a lesser extent, with septic inputs. Please refer to the “Chemical Monitoring Parameters” section of this report for a more detailed explanation.

The **epilimnion** was sampled for chloride during the **July and August** samplings events. The results were **14 and 18 mg/L**, which is ***much less than*** the state acute and chronic chloride criteria. However, this concentration is ***greater than*** what we would normally expect to measure in undisturbed New Hampshire surface waters.

The **Horse Farm** was sampled for chloride on the **July, August and September** sampling events. The results were **14, 20 and 31 mg/L**, which is ***much less than*** the state acute and chronic chloride criteria.

The **Bridge Inlet** was sampled for chloride on the **July, August and September** sampling events. The results were **15, 24 and 21 mg/L**, which is ***much less than*** the state acute and chronic chloride criteria.

The **Lower WTC Inlet** was sampled for chloride on the **July, August and September** sampling events. The results were **< 5, 18 and < 5 mg/L**, which is ***much less than*** the state acute and chronic chloride criteria.

The **Lynn Grove Inlet** was sampled for chloride on the **July, August and September** sampling events. The results were **5.5, 7.4 and < 5**

mg/L, which is ***much less than*** the state acute and chronic chloride criteria.

The **Old Dump Rd** was sampled for chloride on the **July, August and September** sampling events. The results were **14, 19 and 17 mg/L**, which is ***much less than*** the state acute and chronic chloride criteria.

The **Outlet** was sampled for chloride on the **July, August and September** sampling events. The results were **14, 20 and 17 mg/L**, which is ***much less than*** the state acute and chronic chloride criteria.

The **Pleasant Pd Inlet** was sampled for chloride on the **July, August and September** sampling events. The results were **7, 12 and 16 mg/L**, which is ***much less than*** the state acute and chronic chloride criteria.

The **Rte 107 Inlet** was sampled for chloride on the **July, August and September** sampling events. The results were **14, 17 and 23 mg/L**, which is ***much less than*** the state acute and chronic chloride criteria.

The **Rte 4 E Inlet** was sampled for chloride on the **July, August and September** sampling events. The results were **18, 23 and 44 mg/L**, which is ***much less than*** the state acute and chronic chloride criteria.

We recommend that your monitoring group continue to conduct chloride sampling in the epilimnion and tributaries, particularly in the spring during snow-melt and rain events during the summer. This will establish a baseline of data that will assist your monitoring group and DES to determine lake quality trends in the future.

Please note that chloride analyses can be run free of charge at the DES Limnology Center. Please contact the VLAP Coordinator if you are interested in chloride monitoring. In addition, it is best to conduct chloride sampling in the spring as the snow is melting and during rain events.

➤ **Table 14: Current Year Biological and Chemical Raw Data**

Table 14 in Appendix B lists the most current sampling year results. Since the maximum, minimum, and annual mean values for each parameter are not shown on this table, this table displays the current year “raw,” meaning unprocessed, data. The results are sorted by station, depth, and then parameter.

➤ **Table 15: Station Table**

As of the spring of 2004, all historical and current year VLAP data are included in the DES Environmental Monitoring Database (EMD). To facilitate the transfer of VLAP data into the EMD, a new station identification system had to be developed. While volunteer monitoring groups can still use the sampling station names that they have used in the past and are most familiar with, an EMD station name also exists for each VLAP sampling location. Table 15 in Appendix B identifies what EMD station name corresponds to the station names you have used in the past and will continue to use in the future.

DATA QUALITY ASSURANCE AND CONTROL

Annual Assessment Audit:

During the annual visit to your lake, the biologist conducted a sampling procedures assessment audit for your monitoring group. Specifically, the biologist observed the performance of your monitoring group and completed an assessment audit sheet to document the volunteer monitors' ability to follow the proper field sampling procedures, as outlined in the VLAP Monitor's Field Manual. This assessment is used to identify any aspects of sample collection in which volunteer monitors failed to follow proper procedures, and also provides an opportunity for the biologist to retrain the volunteer monitors as necessary. This will ultimately ensure samples that the volunteer monitors collect are truly representative of actual lake and tributary conditions.

Overall, your monitoring group did an **excellent** job collecting samples on the annual biologist visit this year! Specifically, the members of your monitoring group followed the proper field sampling procedures and there was no need for the biologist to provide additional training. Keep up the good work!

Sample Receipt Checklist:

Each time your monitoring group dropped off samples at the laboratory this summer, the laboratory staff completed a sample receipt checklist to assess and document if your group followed proper sampling techniques when collecting the samples. The purpose of the sample receipt checklist is to minimize, and hopefully eliminate, improper sampling techniques.

Overall, the sample receipt checklist showed that your monitoring group did a **very good** job when collecting samples this year! Specifically, the members of your monitoring group followed the majority of the proper

field sampling procedures when collecting and submitting samples to the laboratory. However, the laboratory did identify a few aspects of sample collection that your group could improve upon, as follows:

- **Sample bottle volume:** Please fill each sample bottle up to the neck of the bottle where the bottle curves in. This will ensure that the laboratory staff will have enough sample water to conduct all of the necessary tests.

Please be careful to not overflow the small brown bottle used for phosphorus sampling since this bottle contains acid. If you do accidentally overflow the small brown bottle, please rinse your hands and the outside of the sample bottle and make a note of this on your field sampling sheet. The laboratory staff will put additional acid in the bottle in the laboratory to preserve the sample.

USEFUL RESOURCES

Best Management Practices to Control Nonpoint Source Pollution: A Guide for Citizens and Town Officials, DES Booklet WD-03-42, (603) 271-2975 or

www.des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-03-42.pdf.

Erosion Control for Construction in the Protected Shoreland Buffer Zone, DES fact sheet WD-SP-1, (603) 271-2975 or

<http://des.nh.gov/organization/commissioner/pip/factsheets/sp/documents/sp-1.pdf>

Lake Protection Tips: Some Do's and Don'ts for Maintaining Healthy Lakes, DES fact sheet WD-BB-9, (603) 271-2975 or

www.des.nh.gov/organization/commissioner/pip/factsheets/bb/documents/bb-9.pdf.

NH Stormwater Management Manual Volume 1: Stormwater and Antidegradation, DES fact sheet WD-08-20A, (603) 271-2975 or

<http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-08-20a.pdf>

NH Stormwater Management Manual Volume 2: Post-Construction Best Management Practices Selection and Design, DES fact sheet WD-08-20B, (603) 271-2975 or

<http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-08-20b.pdf>

NH Stormwater Management Manual Volume 3: Erosion and Sediment Controls During Construction, DES fact sheet WD-08-20C, (603) 271-2975 or

<http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-08-20c.pdf>

Proper Lawn Care In the Protected Shoreland, The Comprehensive Shoreland Protection Act, DES fact sheet WD-SP-2, (603) 271-2975 or

<http://des.nh.gov/organization/commissioner/pip/factsheets/sp/documents/sp-2.pdf>.

Road Salt and Water Quality, DES fact sheet WD-WMB-4, (603) 271-2975 or

www.des.nh.gov/organization/commissioner/pip/factsheets/wmb/documents/wmb-4.pdf.